

CLAIMS

What is claimed is:

- 1 1. A wireless communications apparatus comprising:
 - 2 a first antenna arrangement configured to transmit and receive communications
 - 3 signals on a first communications channel within a first section of a spatial
 - 4 area around the wireless communications apparatus, wherein the first antenna
 - 5 arrangement is further configured to determine whether the first
 - 6 communications channel is currently being used to carry communication
 - 7 signals before transmitting any communication signals onto the first
 - 8 communications channel; and
 - 9 a second antenna arrangement configured to transmit and receive communications
 - 10 signals on a second communications channel within a second section of the
 - 11 spatial area around the wireless communications apparatus, wherein the
 - 12 second antenna arrangement is further configured to determine whether the
 - 13 second communications channel is currently being used to carry
 - 14 communication signals before transmitting any communication signals onto
 - 15 the second communications channel.
- 1 2. The wireless communications apparatus as recited in Claim 1, wherein the first and
- 2 second sections of the spatial area around the wireless communications apparatus do
- 3 not overlap and are not adjacent to each other.
- 1 3. The wireless communications apparatus as recited in Claim 1, wherein the first and
- 2 second sections of the spatial area around the wireless communications apparatus are
- 3 adjacent to each other.

1 4. The wireless communications apparatus as recited in Claim 1, wherein the first and
2 second sections of the spatial area around the wireless communications apparatus are
3 different sizes.

1 5. The wireless communications apparatus as recited in Claim 1, wherein the first
2 antenna arrangement is further configured to transmit and receive communications
3 signals on a third communications channel within the first section of the spatial area
4 around the wireless communications apparatus, wherein the third communications
5 channel is on a different frequency within the same frequency band as the first
6 communications channel.

1 6. The wireless communications apparatus as recited in Claim 1, wherein the first
2 antenna arrangement is further configured to transmit and receive communications
3 signals on a third communications channel within the first section of the spatial area
4 around the wireless communications apparatus, wherein the third communications
5 channel is in a different frequency band than the first communications channel.

1 7. The wireless communications apparatus as recited in Claim 6, wherein the first
2 communications channel is in the IEEE 802.11(a) frequency band and the third
3 communications channel is in the IEEE 802.11(b) frequency band.

1 8. The wireless communications apparatus as recited in Claim 1, wherein the first
2 antenna arrangement is further configured to transmit and receive communications
3 signals on the first communications channel using a time division multiple access
4 communications protocol.

1 9. The wireless communications apparatus as recited in Claim 8, wherein a carrier sense
2 mechanism is used to select the first and second communications channels.

- 1 10. The wireless communications apparatus as recited in Claim 1, wherein the first
2 antenna arrangement is further configured to determine whether the first
3 communications channel is currently being used to carry communication signals
4 before transmitting any communication signals onto the first communications channel
5 using a carrier sense mechanism.
- 1 11. The wireless communications apparatus as recited in Claim 1, wherein the wireless
2 communications apparatus is a wireless access point communicatively coupled to a
3 wired network.
- 1 12. The wireless communications apparatus as recited in Claim 1, wherein the first
2 antenna arrangement and the second antenna arrangement are configured to allow
3 simultaneous separate communications on the first and second communications
4 channels.
- 1 13. The wireless communications apparatus as recited in Claim 12, wherein the first and
2 second communications channels are the same frequency.
- 1 14. The wireless communications apparatus as recited in Claim 1, wherein the first and
2 second antenna arrangements are configured with different polarization orientations.
- 1 15. The wireless communications apparatus as recited in Claim 1, wherein the first and
2 second communications channels are selected to reduce interference between the first
3 and second sections.
- 1 16. The wireless communications apparatus as recited in Claim 1, wherein the first and
2 second antenna arrangements are configured to reduce interference between the first
3 and second sections.

- 1 17. The wireless communications apparatus as recited in Claim 1, wherein the wireless
2 communications apparatus is configured to dynamically change the size of the first
3 section.
- 1 18. The wireless communications apparatus as recited in Claim 1, further comprising a
2 manager mechanism configured to aggregate data received from the first and second
3 antenna arrangements.
- 1 19. The wireless communications apparatus as recited in Claim 1, further comprising a
2 manager mechanism configured to, in response to a wireless device moving from the
3 first section into the second section, updating and storing data that indicates that
4 communications with the wireless device are now to be performed using the second
5 antenna arrangement.
- 1 20. The wireless communications apparatus as recited in Claim 1, further comprising a
2 switch configured to provide for the switching of data between the first and second
3 antenna arrangements.
- 1 21. The wireless communications apparatus as recited in Claim 1, further comprising a
2 switch configured to provide for the switching of data between the first antenna
3 arrangement and a network.
- 1 22. The wireless communications apparatus as recited in Claim 1, wherein the wireless
2 communications apparatus is configured to selectively and separately manage
3 transmit power levels and receive sensitivities for the first and second antenna
4 arrangements.
- 1 23. The wireless communications apparatus as recited in Claim 1, wherein the first
2 antenna arrangement is configured to selectively and separately manage transmit
3 power levels on a per-wireless device basis.

- 1 24. A wireless access point for providing wireless access to a wired network within a
2 building, the wireless access point comprising:
3 a first antenna arrangement configured to communicate with wireless devices within a
4 first section of a spatial area around the wireless access point, wherein the first
5 antenna arrangement is further configured to determine whether a first
6 communications channel assigned to the first section of the spatial area is
7 currently being used to carry communication signals before transmitting any
8 communication signals onto the first communications channel;
9 a second antenna arrangement configured to communicate with wireless devices
10 within a second section of a spatial area around the wireless access point,
11 wherein the second antenna arrangement is further configured to determine
12 whether a second communications channel assigned to the second section of
13 the spatial area is currently being used to carry communication signals before
14 transmitting any communication signals onto the second communications
15 channel; and
16 a management mechanism configured to manage the operation of the first and second
17 antenna arrangements and to manage the exchange of data between wireless
18 devices in the first and second sections of the spatial area and the wired
19 network in the building.
- 1 25. An antenna apparatus configured to enable selective wireless communications with
2 wireless devices located in first and second sections of a spatial area around the
3 antenna apparatus, the antenna apparatus comprising:
4 a central metal reflector; and

5 a plurality of metal septums extending outward from the central metal reflector into
6 the spatial area around the antenna apparatus to define the first and second
7 sections.

1 26. The antenna apparatus as recited in Claim 25, wherein the plurality of metal septums
2 are separated from the central metal reflector to reduce electromagnetic coupling
3 between the first and second sections.

1 27. The antenna apparatus as recited in Claim 26, wherein the plurality of metal septums
2 are separated from the central metal reflector by a distance that is proportional to a
3 transmission wavelength used with the antenna apparatus.

1 28. The antenna apparatus as recited in Claim 25, further comprising a plurality of radio
2 frequency chokes disposed on the plurality of metal septums.

1 29. The antenna apparatus as recited in Claim 25, further comprising:
2 a first radiating assembly disposed between the plurality of metal septums to provide
3 wireless communications with the first set of wireless devices in the first
4 section; and
5 a second radiating assembly disposed between the plurality of metal septums to
6 provide wireless communications with the second set of wireless devices in
7 the second section.

1 30. The antenna apparatus as recited in Claim 29, wherein the first radiating assembly
2 comprises a first patch element having a first radiating element configured to transmit
3 in a first frequency band.

1 31. The antenna apparatus as recited in Claim 30, wherein the first radiating element is
2 further configured to transmit in a second frequency band.

- 1 32. The antenna apparatus as recited in Claim 30, wherein the first radiating assembly
2 comprises a second patch element having a second radiating element, wherein the
3 second patch element is oriented with respect to the first patch element to provide
4 polarization diversity.
- 1 33. The antenna apparatus as recited in Claim 29, wherein the first and second radiating
2 assemblies are separated by a specified distance and the antenna apparatus is
3 configured to select the first or second antenna apparatus to transmit or receive an RF
4 signal.
- 1 34. The antenna apparatus as recited in Claim 30, wherein the first radiating assembly
2 comprises a second patch element having a second radiating element, wherein the
3 second patch element is oriented with respect to the first patch element to provide
4 polarization diversity.
- 1 35. The antenna apparatus as recited in Claim 34, wherein the second patch element is
2 oriented at about ninety degrees with respect to the first patch element.
- 1 36. The antenna apparatus as recited in Claim 25, further comprising periodic structures
2 to reduce surface wave propagation and sector coupling.
- 1 37. A wireless communications system comprising:
2 a first antenna arrangement having a first transceiver configured to transmit and
3 receive communications signals on a communications channel within a first
4 section of a spatial area around the wireless communications apparatus;
5 a second antenna arrangement having a second transceiver configured to transmit and
6 receive communications signals on the communications channel within a
7 second section of the spatial area around the wireless communications
8 apparatus; and

9 wherein a carrier sense multiple access, collision avoidance algorithm based on
10 carrier sense or energy detect, or a point coordinating function is used to allow
11 communications on the communications channel in both the first and second
12 sections to occur.

1 38. The wireless communications apparatus as recited in Claim 39, further comprising a
2 network manager configured to control the transfer of data between the first and
3 second sections and a network.